Comprehensive configuration management at thyssenkrupp Marine Systems

Thyssenkrupp Marine Systems GmbH is the leading European system provider for submarines and naval vessels. As a technology and service leader in the European naval industry, thyssenkrupp Marine Systems is consistently driving the "digital yard" goal. To master the complexity of product development in technologically demanding and long-running projects, a comprehensive configuration management is sought.

Configuration management throughout the product lifecycle

As defined, *"configuration management is a management process to make and comply with product deliverables, as well as functional and physical properties of the product throughout the product lifecycle"*
(freely translated to ANSI/EIA-649-A).

The goals of configuration management are:

1. Ensuring the integrity of the product
2. Reproduce previous configurations at any time
3. Make content and differences of different configurations visible at any time
4. Traceable and traceable changes
5. Adherence to planned costs and framework

The information distributed in the system landscape (SAP ECC, authoring systems, requirements systems) is to be combined in a configuration structure using a middleware in the SAP system to fulfill the targets.

SAP Product and Process Governance by BDF - The Core of the Configuration Structure

SAP Product and Process Governance by BDF (SAP PPG) and its configuration structures are used to map configuration management. The PPG node with its PPG variants forms the nucleus of the configuration structure and offers the option of combining various SAP objects, information, and processes.

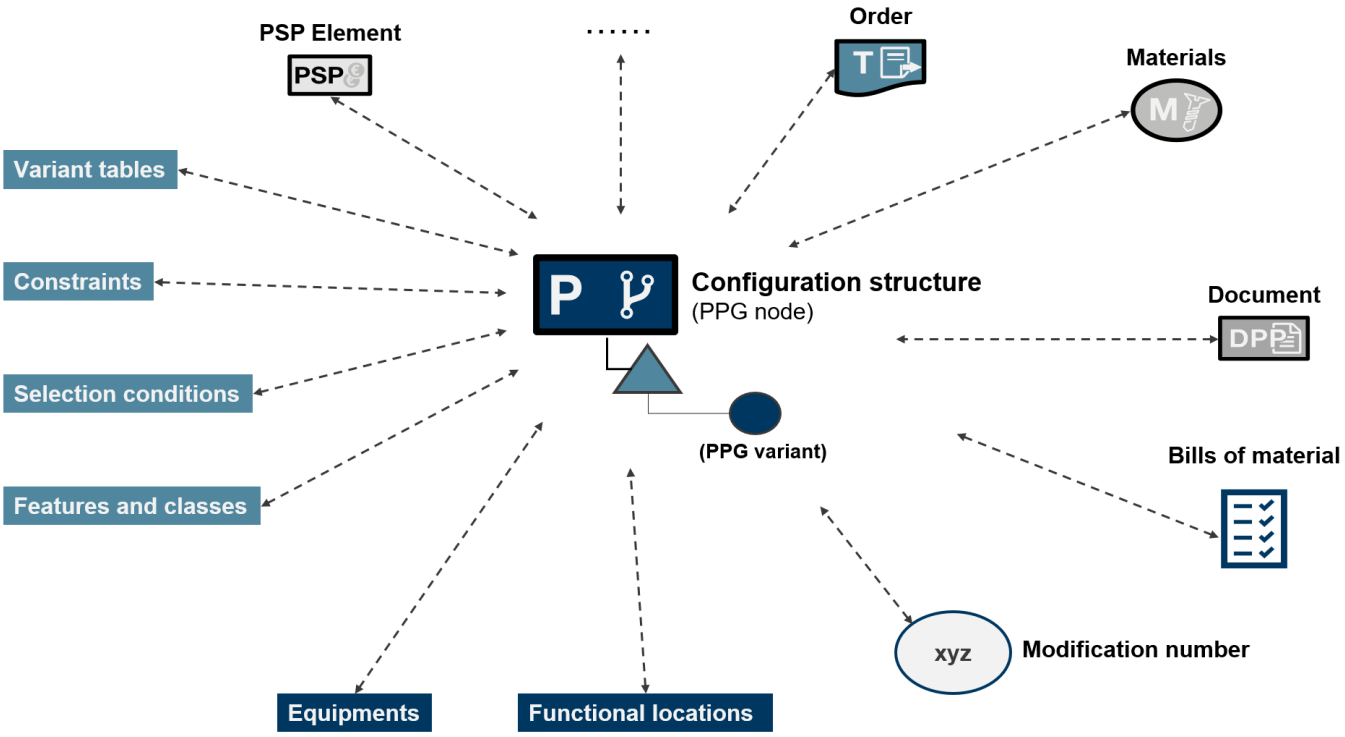


Figure 1 : the PPG node as a nucleus

Active Planning of Processes or Objects

Planning Objects

- Materials
- Documents
- Bill of Material

Planning Processes

- Purchase Integration
- PP Integration
- SD Integration
- Subsystems

Depending on Customizing, the PPG node can be used for different tasks within a structure by assigning different tab pages (views), links, and functions to it.

The PPG node is also used as a configuration unit (“KE”) in the context of configuration management. The PPG node with a material master assigned via a PPG variant (1-n) as well as assigned document info records and metadata forms a configuration unit. Depending on the general and item related status, this configuration unit can be used in a structure or can also be restored.

In addition to the project-neutral configuration unit, a project-specific configuration unit ("KE usage") is also used in the configuration structure to map project-specific information. For example, the CU usage is used to assign only the material master used at this point.

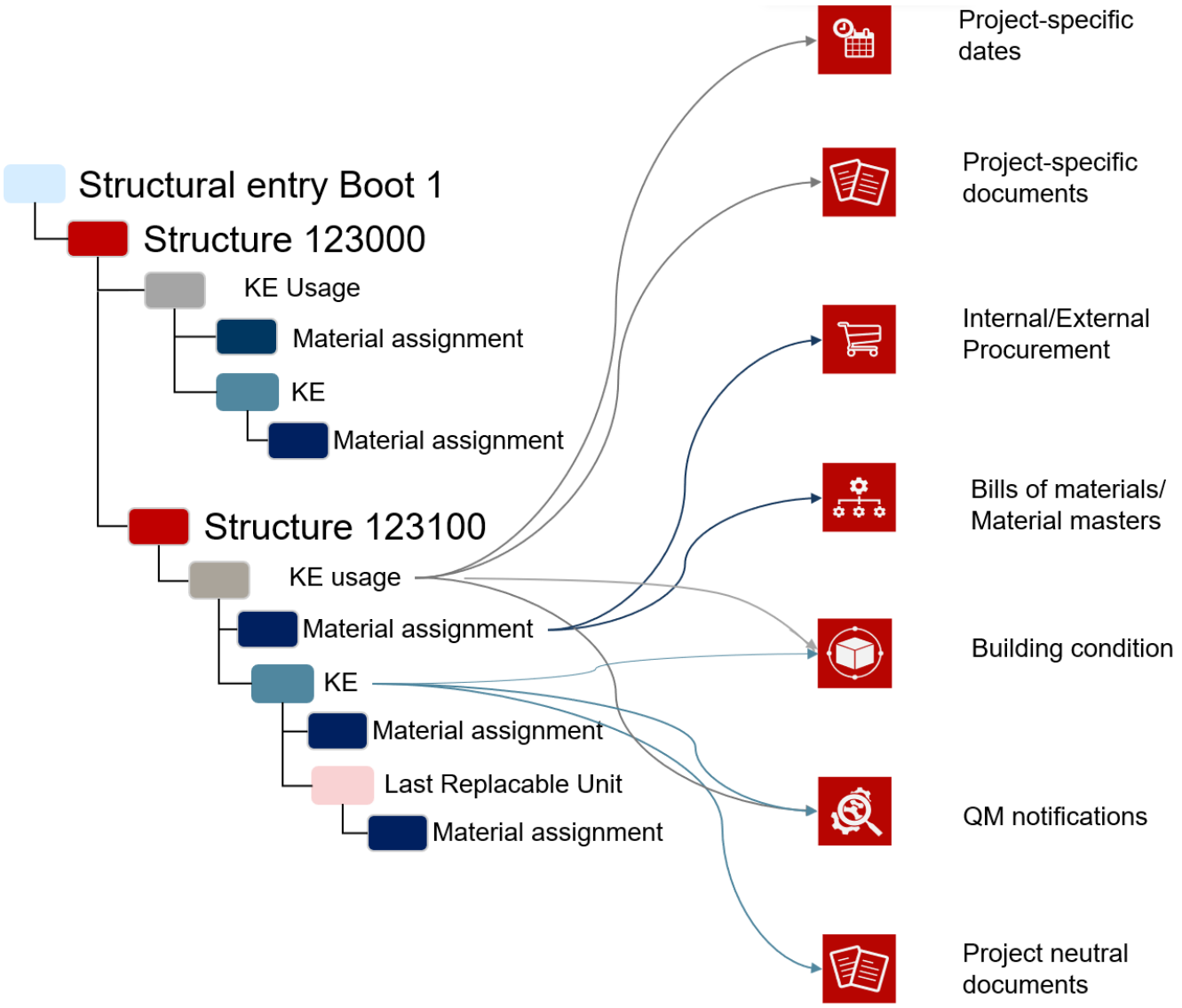


Figure 2: Example of a boat's configuration structure

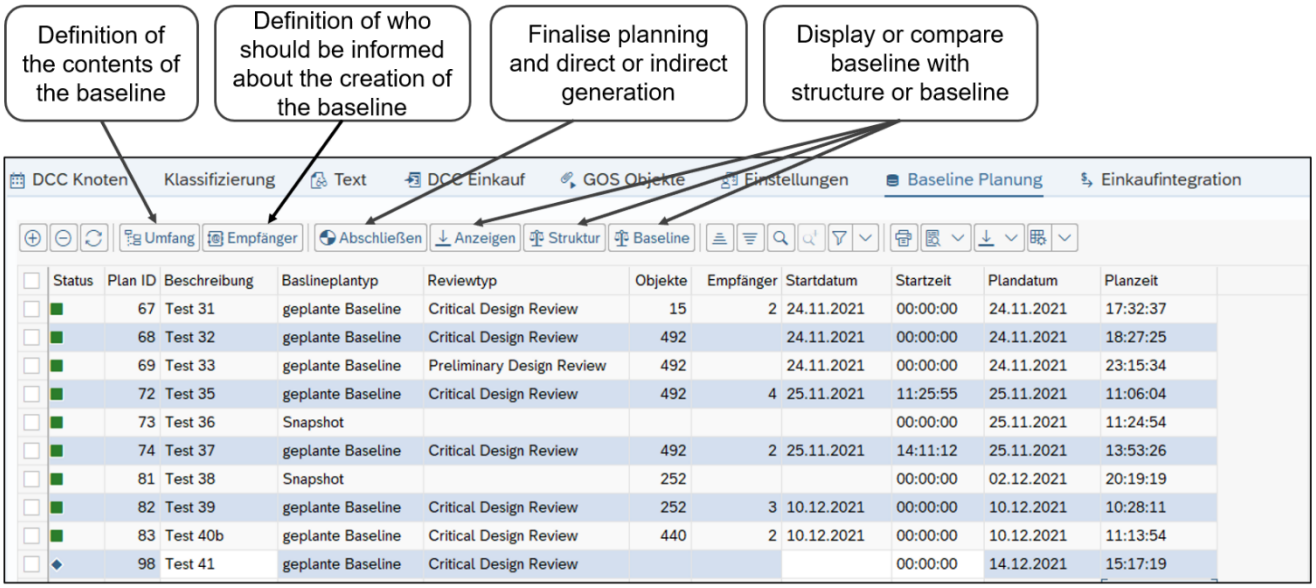
The configuration unit and the configuration unit "*CU Usage*" are largely defined by engineering. The Last Replacable Unit (last component that can be exchanged individually) is used to map the further detailing of the individual materials created by the service. This can further detail the configuration unit (project-neutral) or the configuration unit usage (project-specific) at any depth. The configuration structure for a product is built from these modules and other outline levels. The structure and materials used come directly into the configuration structure via integration with a middleware from the authoring and requirements system.
Alternatively, the entire structure or parts of it (for example, a structure or the Last Replacable Units) can be imported directly into the system via a load file and new structures can be created or existing structures changed. For the migration of existing products in particular, this is a suitable way of bringing existing products to the current stage of the process.

“The PPG structure can now be used to map everything from the first requirement to development, procurement, production, and service. The maintenance of our boat structures after delivery can also be facilitated by integrating the service into our tool landscape.“

– Nils Hülsmann,
IT project management for configuration management at thyssenkrupp Marine Systems GmbH

At various levels within the structure, various information is available and objects are linked, giving an overall picture of the configuration beyond the engineering view. Direct integration with logistics (purchasing and production), as well as internal quality management and the construction condition (mapping of functional locations and equipment) complete this screen.

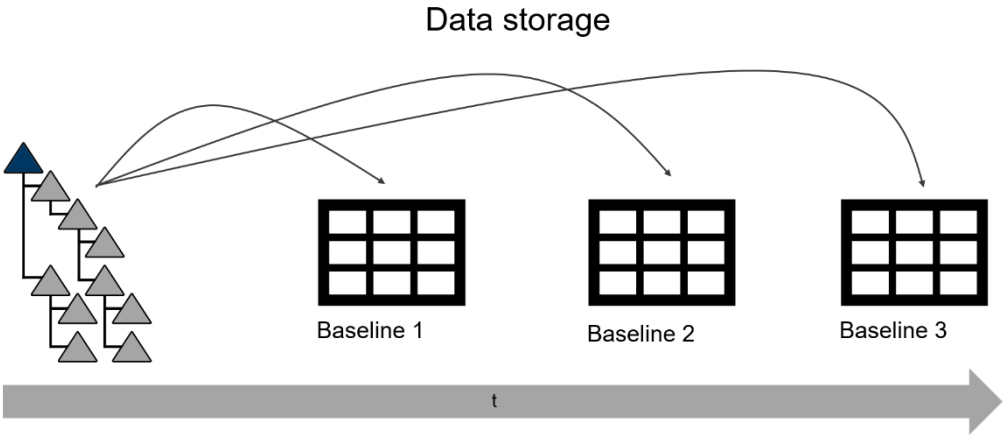
Based on this structure, baselines (which describes, among other things, a series of released documents with specific revision levels that fully define a configuration at a certain point in time) can be planned to represent the individual milestones within the product lifecycle, define their scope, define recipients, and generate them automatically.



Status	Plan ID	Beschreibung	Baslineplantyp	Reviewtyp	Objekte	Empfänger	Startdatum	Startzeit	Plandatum	Planzeit
■	67	Test 31	geplante Baseline	Critical Design Review	15	2	24.11.2021	00:00:00	24.11.2021	17:32:37
■	68	Test 32	geplante Baseline	Critical Design Review	492		24.11.2021	00:00:00	24.11.2021	18:27:25
■	69	Test 33	geplante Baseline	Preliminary Design Review	492		24.11.2021	00:00:00	24.11.2021	23:15:34
■	72	Test 35	geplante Baseline	Critical Design Review	492	4	25.11.2021	11:25:55	25.11.2021	11:06:04
■	73	Test 36	Snapshot					00:00:00	25.11.2021	11:24:54
■	74	Test 37	geplante Baseline	Critical Design Review	492	2	25.11.2021	14:11:12	25.11.2021	13:53:26
■	81	Test 38	Snapshot		252			00:00:00	02.12.2021	20:19:19
■	82	Test 39	geplante Baseline	Critical Design Review	252	3	10.12.2021	00:00:00	10.12.2021	10:28:11
■	83	Test 40b	geplante Baseline	Critical Design Review	440	2	10.12.2021	00:00:00	10.12.2021	11:13:54
◆	98	Test 41	geplante Baseline	Critical Design Review				00:00:00	14.12.2021	15:17:19

Figure 3: Baseline Planning in the Configuration Structure

The baseline is created as a representation of the structure and can be compared with other baselines or the structure. Differences are displayed and can be traced in the individual comparison.



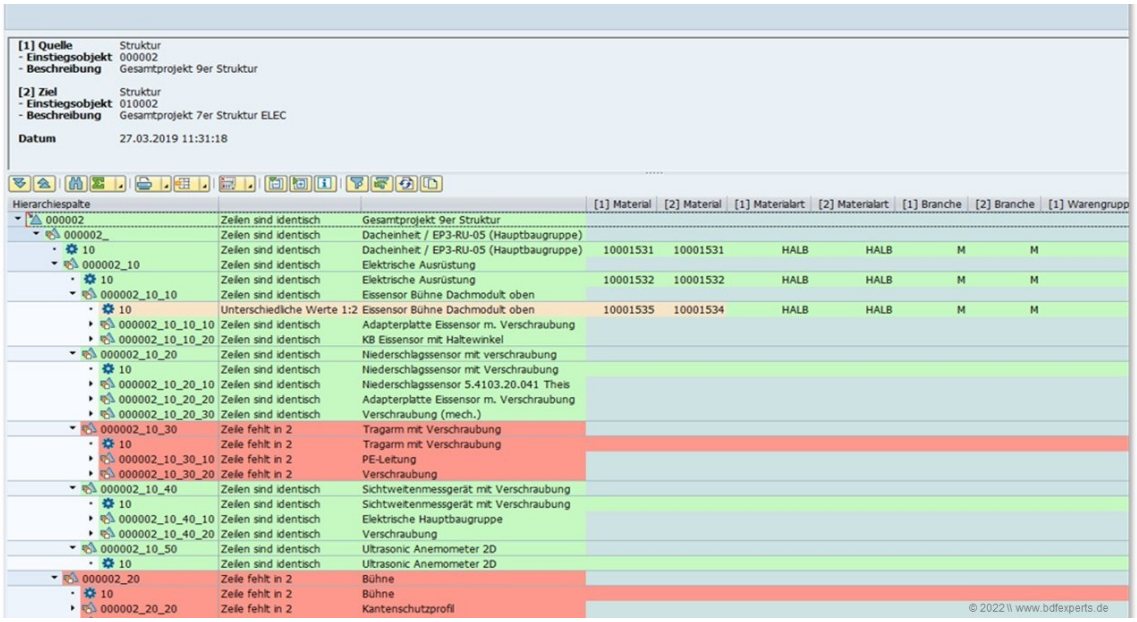


Figure 4: Creation and Comparison of Baselines

All information about the configuration of the product in one central location

The configuration structure enables the configuration manager to have a sufficient view of the status of the product. Due to the integration with the authoring and requirements systems, the current data from the system landscape is always available in one place. As a result, the information procurement effort has been reduced. In addition to mapping the target configuration, the structure can also be used to plan and track the planning status using Progress Tracking (for example, “As Sold” comparison with current target structure status). The structure information can also be used as a product structure for integration into logistical processing. By merging the data, extensive baselines of the product can also be created and used for internal development progress and communication with external partners. From a change management perspective, dependencies to changes can be easily identified and their impact can be determined. Changes

can then also be forwarded to the respective objects and their confirmation processed. Finally, by applying the functional location and equipment structure associated with the configuration structure, the manufactured product is also represented in the serialized construction condition.

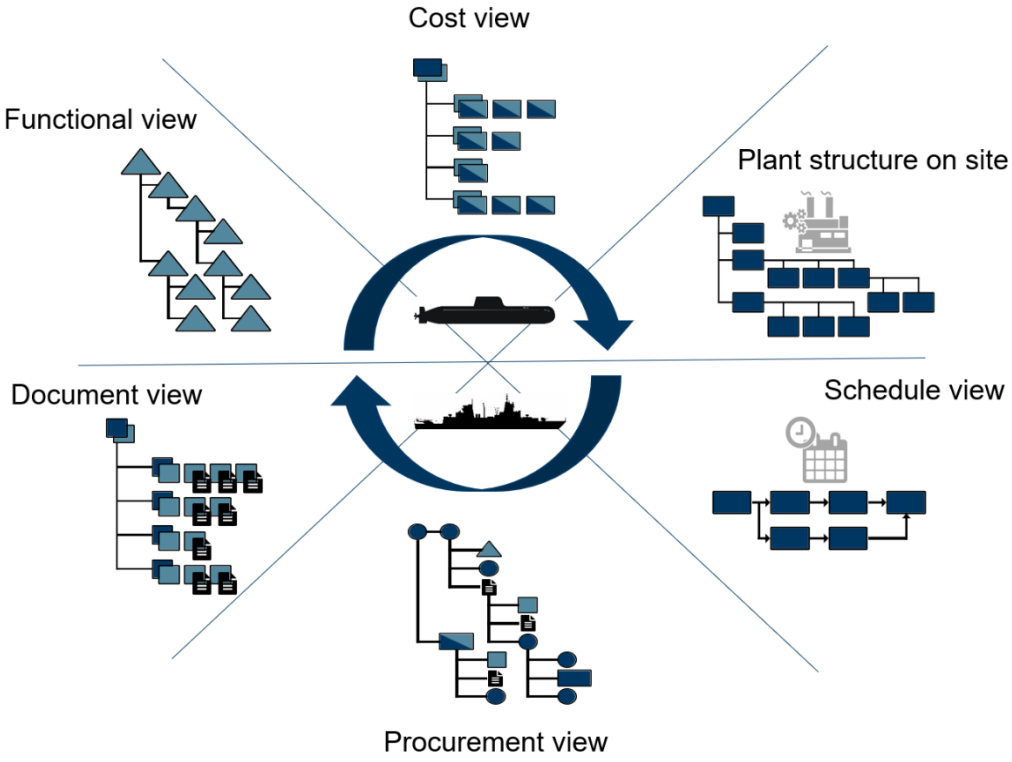


Figure 5: View Concept PPG

More on thyssenkrupp Marine Systems GmbH

Locations:	Bremen, Emden, Flintbek, Hamburg, Kiel, Wedel, Wismar
Industry:	Navy Shipbuilding and Electronics
Products and Services:	System providers for submarines and naval vessels
Number of employees:	6,500

Internet address: https://www.thyssenkrupp-marinesystems.com

The project in a nutshell

Challenge :	The introduction of configuration management with the interaction of different systems
Task and Objective:	Implementation of Configuration Management Using SAP PPG
BDF products used and SAP modules used	SAP iPPE, SAP PPG
Benefit:	Complete configuration structure for the product in the SAP system

More on BDF EXPERTS

BDF provides the EXPERTs in SAP consulting and software development in Product Lifecycle Management, Supply Chain Management, Maintenance & Service, and Corporate Finance & Treasury based on S/4 HANA and SAP ERP. We advise large midsize companies to global corporations in the DACH region.

As a team of digitalization experts, we are digitalizing and optimizing the data and processes of our customers. Our SAP product, the SAP PPG by BDF, supports digital business processes from product creation to product service. We use the UDF Cash Position Cockpit (UDF CPC) to optimize the financial supply chain. This is how we work together to get the most out of your SAP world.

Learn more: www.bdfexperts.de